CLAIMS

1. A surface-coated cutting tool (1), comprising:

a base material (2); and

a coated film (3) formed on said base material (2); wherein

said coated film (3) serves as an outermost layer on said base material (2) and has compressive stress,

said compressive stress is varied so as to have strength distribution in a direction of thickness of said coated film (3), and

said strength distribution is characterized in that the compressive stress at a surface (4) of said coated film continuously decreases from said surface (4) of said coated film toward a first intermediate point (5) located between said surface (4) of said coated film and a bottom surface (6) of said coated film and the compressive stress attains a relative minimum point at said first intermediate point (5).

2. The surface-coated cutting tool (1) according to claim 1, wherein

said strength distribution is characterized in that a maximum compressive stress is attained at said surface (4) of said coated film and the compressive stress maintains a constant value from said first intermediate point (5) to said bottom surface (6) of said coated film.

3. The surface-coated cutting tool (1) according to claim 2, wherein

said compressive stress is stress in a range from at least −15GPa to at most 0GPa.

4. The surface-coated cutting tool (1) according to claim 2, wherein

said first intermediate point (5) is located at a position distant from said surface (4) of said coated film by at least 0.1% to at most 50% of the thickness of said coated film (3).

5. The surface-coated cutting tool (1) according to claim 2, wherein said compressive stress at said first intermediate point (5) is set to a value comparable to 20 to 90% of the compressive stress at said surface (4) of said coated film.

6. The surface-coated cutting tool (1) according to claim 5, wherein said compressive stress at said first intermediate point (5) is set to a value comparable to 40 to 80% of the compressive stress at said surface (4) of said coated film.

7. The surface-coated cutting tool (1) according to claim 2, wherein said compressive stress attains maximum at said surface (4) of said coated film, the maximum compressive stress is maintained across a prescribed distance from said surface (4) of said coated film toward said first intermediate point (5), and thereafter said compressive stress continuously decreases toward said first intermediate point (5).

8. The surface-coated cutting tool (1) according to claim 1, wherein said strength distribution is characterized in that said compressive stress continuously increases from said first intermediate point (5) toward said bottom surface (6) of said coated film.

9. The surface-coated cutting tool (1) according to claim 8, wherein said compressive stress is the stress in a range from at least −15GPa to at most 0GPa.

10. The surface-coated cutting tool (1) according to claim 8, wherein said first intermediate point (5) is located at a position distant from said surface

(4) of said coated film by at least 0.1% to at most 50% of the thickness of said coated film (3).

11. The surface-coated cutting tool (1) according to claim 8, wherein said compressive stress attains maximum at said surface (4) of said coated film.

12. The surface-coated cutting tool (1) according to claim 8, wherein said compressive stress at said first intermediate point (5) is set to a value comparable to 20 to 90% of the compressive stress at said surface (4) of said coated film.

13. The surface-coated cutting tool (1) according to claim 12, wherein said compressive stress at said first intermediate point (5) is set to a value comparable to 40 to 80% of the compressive stress at said surface (4) of said coated film.

14. The surface-coated cutting tool (1) according to claim 8, wherein said compressive stress at said surface (4) of said coated film is maintained across a prescribed distance from said surface (4) of said coated film toward said first intermediate point (5), and thereafter said compressive stress continuously decreases toward said first intermediate point (5).

15. The surface-coated cutting tool (1) according to claim 1, wherein said strength distribution is characterized in that said compressive stress continuously increases from said first intermediate point (5) toward a second intermediate point (9) located between said first intermediate point (5) and said bottom surface (6) of said coated film and attains a relative maximum point at said second intermediate point (9).

16. The surface-coated cutting tool (1) according to claim 15, wherein said compressive stress is the stress in a range from at least −15GPa to at most 0GPa.

17. The surface-coated cutting tool (1) according to claim 15, wherein said first intermediate point (5) is located at a position distant from said surface (4) of said coated film by at least 0.1% to at most 50% of the thickness of said coated film (3).

18. The surface-coated cutting tool (1) according to claim 15, wherein said second intermediate point (9) is located at a position distant from said surface (4) of said coated film by at least 0.2% to at most 95% of the thickness of said coated film (3).

19. The surface-coated cutting tool (1) according to claim 15, wherein said compressive stress attains maximum at said surface (4) of said coated film.

20. The surface-coated cutting tool (1) according to claim 15, wherein said compressive stress at said first intermediate point (5) is set to a value comparable to 20 to 90% of the compressive stress at said surface (4) of said coated film.

21. The surface-coated cutting tool (1) according to claim 20, wherein said compressive stress at said first intermediate point (5) is set to a value comparable to 40 to 80% of the compressive stress at said surface (4) of said coated film.

22. The surface-coated cutting tool (1) according to claim 15, wherein said compressive stress at said surface (4) of said coated film is maintained across a prescribed distance from said surface (4) of said coated film toward said first intermediate point (5), and thereafter said compressive stress continuously decreases toward said first intermediate point (5).

23. The surface-coated cutting tool (1) according to claim 1, wherein said strength distribution is characterized in that said compressive stress continuously increases from said first intermediate point (5) toward a second intermediate point (9) located between said first intermediate point (5) and said bottom surface (6) of said coated film and attains a relative maximum point at said second intermediate point (9), and said strength distribution has one or more similar said relative minimum point between said second intermediate point (9) and said bottom surface (6) of said coated film.

24. The surface-coated cutting tool (1) according to claim 23, wherein said strength distribution has one or more similar said relative maximum point between said second intermediate point (9) and said bottom surface (6) of said coated film.

25. The surface-coated cutting tool (1) according to claim 23, wherein said strength distribution has one or more said similar relative minimum point and one or more said similar relative maximum point in an alternate and repeated manner in this order between said second intermediate point (9) and said bottom surface (6) of said coated film.

26. The surface-coated cutting tool (1) according to claim 23, wherein said compressive stress is the stress in a range from at least −15GPa to at most

0GPa.

27. The surface-coated cutting tool (1) according to claim 23, wherein said first intermediate point (5) is located at a position distant from said surface (4) of said coated film by at least 0.1% to at most 40% of the thickness of said coated film (3).

28. The surface-coated cutting tool (1) according to claim 23, wherein said second intermediate point (9) is located at a position distant from said surface (4) of said coated film by at least 0.2% to at most 80% of the thickness of said coated film (3).

29. The surface-coated cutting tool (1) according to claim 23, wherein said compressive stress attains maximum at said surface (4) of said coated film.

30. The surface-coated cutting tool (1) according to claim 23, wherein said compressive stress at said first intermediate point (5) is set to a value comparable to 10 to 80% of the compressive stress at said surface (4) of said coated film.

31. The surface-coated cutting tool (1) according to claim 30, wherein said compressive stress at said first intermediate point (5) is set to a value comparable to 20 to 60% of the compressive stress at said surface (4) of said coated film.

32. The surface-coated cutting tool (1) according to claim 23, wherein said compressive stress at said surface (4) of said coated film is maintained across a prescribed distance from said surface (4) of said coated film toward said first intermediate point (5), and thereafter said compressive stress continuously decreases toward said first intermediate point (5).